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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/550,843

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EXAMINER

NGUYEN, TUAN N

ART UNIT

PAPER NUMBER

2828

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/550,843	Applicant(s) CALVEZ ET AL.	
	Examiner TUAN N. NGUYEN	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/20/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION
Response to Election and Amendment

1. Applicant's election figure 12, and claims 1,2, 7-12, 15, 19-27 with traverse that all claims are directed to optical devices and method for engineering an optical device and all the claims are closely related, particularly true with independent claims 1, 20, 21, 22, and 25 read on the same species. Further more, claims 1-4, 7-11, 13-15, 17-27 have been amended. Applicant's election with traverse of claims 1-27 in the reply filed on 9/2/2009 is acknowledged and has been withdrawn. Claims are rejected based on what it being claim and obviousness according to response to election.

Claim Rejections - 35 USC § 102

2. The following is a quotation of 35 U.S.C. 102(b) which forms the basis for all obviousness rejections set forth in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-12, 14,15, 17-27 are rejected under 35 U.S.C. 102(b) as being unpatentable over Salokatve et al. (US 6,327,293).

With respect to claim 1, Salokatve et al. '293 shows and discloses an optical device, comprising: (a) an active semiconductor region configured to provide gain to signal light passing through said active region (*Fig 1:16a active region provide gain to signal light*); (b) a signal-light reflector arranged to reflect the signal light through the active region in a direction out of the plane of the active region (*Fig 1:14 reflector reflect light through active region out of the plane of active region*) ; (c) a pump-light reflector arranged to reflect pump light so as to form a pump standing wave in the device (*Fig 1:22,23 pump-light reflector reflect pump light to form*

Art Unit: 2828

standing wave in the device); and an absorber configured to absorb light at a wavelength of the signal light and located at a position in the device at which there is no or substantially no pump light (*Fig 2; Col 7-8 :5-25 an absorber function as absorbing light at a position in the device which there is no or substantially no pump light because light is absorbed*).

With respect to claim 2, where the active region, the signal-light reflector, the pump-light reflector and the absorber are comprised in a monolithic unit. (*Fig 1,2,3*)

With respect to claims 3-6, where the absorber is arranged at or near a node in the pump standing wave; and where the active region comprises an element for interacting with light in the device; and where the signal light forms a signal standing-wave by reflection from the signal-light reflector; and the absorber is arranged at or near an anti-node in the signal standing-wave . (*Fig1-3 2; Col 7-8 :5-25*).

With respect to claims 7, 8 further comprising a second device for interacting with light, comprising a gain element that absorbs the pump light to provide gain to the signal light; and in which the gain element is arranged at or near an anti-node in the signal standing wave. (*Fig 2,3:x14, 16; Col 7-8 :5-25 a a second device interacting with light comprising a gain element that absorbs the pump light to provide gain to signal light*).

With respect to claims 9, 10 in which the signal-light reflector comprises a metal mirror or a semiconductor mirror or a dielectric stack; or the pump-light reflector comprises a metal mirror or a semiconductor mirror or a dielectric stack. (*Col 7:19-25; 35-45 signal-light reflector or pump-light reflector comprises a dielectric stack or metal mirror*)

With respect to claims 11, 12 comprising a second pump-light reflector positioned for reflecting the pump light back towards the pump-light reflector; and which the second pump-light reflector comprises a metal mirror or a dielectric stack. *(Col 7:19-25; 35-45 a second pump-light reflector pump light back toward pump-light reflector and comprises dielectric or metal)*

With respect to claim 14, which the pump-light reflector and the signal-light reflector are comprised in a single reflector. *(Fig 1)*

With respect to claims 15, 17, 18 comprising a second signal-light reflector arranged for reflecting the signal light back towards the signal-light reflector; and in which reflections from at least the signal-light reflector and the second signal-light reflector result in a cavity resonance or a sub-cavity resonance at a signal wavelength at which the active region provides gain, and the device further comprising a source of pump light at a pump wavelength, wherein the signal-light reflector reflects pump light at the pump wavelength; and in which reflections from at least the signal-light reflector and the second signal-light reflector result in a cavity resonance or a sub-cavity resonance at the pump wavelength. *(Col: 7-8; Fig 1: 22, 23, 14)*

With respect to claim 19, the device being arranged to provide pulses of signal light. *(Fig1).*

With respect to claims 20, 21 Salokatve et al. '293 shows and discloses an optical device, comprising: (a) an active semiconductor region configured to provide gain to signal light passing through said active region *(Fig 1: 16 active region provide gain signal light passing through it)*; (b) a signal-light reflector arranged to reflect the signal light through the active region in a

Art Unit: 2828

direction out of the plane of the active region (*Fig 1: 14, 22 a signal-light reflector reflect light through active region and out of the plane*); and (c) an absorber located in a position in the device selected to control absorption of pump light by the absorber (*Fig 2: 16a; Col 6; ABSTRACT: absorber in device control absorption of pump light*). Since claim 21 recites the same or identical elements/limitations it is inherent to use patent '293 to recite the method of engineering an optical device, product by process.

With respect to claim 22 Salokatve et al. '293 shows and discloses an optical device, comprising: (a) an active semiconductor region configured to provide gain to signal light passing through said active region (*Fig 1:16 active region provide gain signal light passing through it*); (b) a signal-light reflector arranged to reflect the signal light through the active region in a direction out of the plane of the active region (*Fig 1:14,22 a signal-light reflector reflect light through active region and out of the plane*); and (c) a pump-light reflector arranged between the signal light reflector and the active region (*Fig 1: 23, 20, 28*).

With respect to claims 23, 24 further comprising an element/is a saturable absorber for interacting with signal light in the device, the element being arranged between the pump light reflector and the signal light reflector (*Fig 2: 16a, 50, 46*).

With respect to claim 25 Salokatve et al. '293 shows and discloses an optical device, comprising: (a) an active semiconductor region configured to provide gain to signal light passing through said active region (*Fig 1:16 active region provide gain signal light passing through it*); (b) a signal-light reflector arranged to reflect the signal light through the active region in a direction out of the plane of the active region (*Fig 1:14, 22 a signal-light reflector reflect light*

Art Unit: 2828

through active region and out of the plane); (c) a pump-light reflector arranged to reflect pump light so as to form a pump standing wave in the device; and an element, arranged in the pump standing wave, effective to absorb pump light to provide gain to the signal light, the element being arranged at or near to an antinode of the pump standing wave (Fig 2: 16a; Col 7&8: 5-25 reflector form standing wave and absorber that absorb pump light near to antinode of standing wave; claim 1).

With respect to claims 26, 27 in which the element is arranged such that pump light is absorbed in the same region of the active region from which signal light is emitted; or in which the element is a barrier region adjacent to a quantum well (Fig 2).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or non-obviousness.

Art Unit: 2828

5. Claims 13, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salokatve et al. (US 6,327,293).

With respect to claim 13, the claim further requires a monolithic or composite laser structure fabricated with a bottom Bragg reflector that reflects the pump and the signal, such that a pump field forms a standing wave. Salokatve et al. '293 shows and discloses the above without discreet stating the bottom mirror is a bragg reflector. However, Salokatve et al. '293 does disclose the bottom mirror is an alternate dielectric layers, which one skill in the art can recognize as bragg mirror reflector. In addition, it has been held that omission of an element where the remaining elements perform the same functions as before involves only routine skill in the art, in this case it is well known in the art the DBR/bragg reflector are used in VCSEL/semiconductor device to resonate wavelength output.

With respect to claim 16, the claim requires the second signal-light reflector comprises a metal mirror stack. (Col 7).

PRIOR ART

6. The prior art made of record and relied upon is considered pertinent to applicant's discloses.

Moorandian et al. (US 5,627,853), Zheng (US 6,859,481), and see PTOL 892 – optical device with quantum well, absorb layer, with bottom DBR and mirror to create a resonating standing antinode wave in a monolithic structure.

Communication Information

Art Unit: 2828

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on M-F: 7:30 - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey Minsun can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tuan N Nguyen/
Examiner, Art Unit 2828

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828